Case study title: **Use of CDCM-TAOS in the Vulnerability Assessment of Sea Defenses**

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Case study emphasis: Review Procedures for Assessing Vulnerability of Sea Defenses

Summary:

The Arbiter Of Storms (TAOS) is a system based on over 100 years of storm data, which can be used for the reliable estimation of wind, wave and surge conditions and values under the event of a tropical storm or hurricane, and was developed under the USAID-OAS-UWI Coastal Design Construction and Maintenance (CDCM) initiative in the Caribbean in 2001. This paper presents a case study of the CDCM-TAOS system utility in assessing the vulnerability and suitability of a rubble mound sea defense system on the gulf coast of Trinidad.
The system, along with other design utilities developed under CDCM, was employed to assess the site functionality and wave climate, armor layer stability and damage, and wave run-up, as inputs for a suitable cross-section design. Essential relationships between storm duration, stone weight and damage were then developed to express and ascertain the level of exposure and resulting damage the defense system would experience under the event of a 1 in 50-year Maximum Likely Event storm. The level of risk reduction desired was then defined and a suitable defense system selected for construction.

Date that model application was completed: August 2002

Case study geographical location: Point Fortin, Trinidad and Tobago, West Indies

Vulnerability assessment indicators: Wave Height, Storm Surge, Storm Duration, Sea Defense Damage

Methodology data requirements: Coordinate site location, storm return period, reliability level for event occurrence, the TAOS – CDCM system, construction materials' properties, cross section of sea defense.

Direct participants in the application of the model of the vulnerability assessment: Governmental Research/Training Institute

Methodology objective: To assess the overall resistance of sea defenses to storm/hurricane attack.

Methodology output: Relationship between storm duration and sea defense damage.

Results of methodology application at case study site: Sea Defense design was revised to account for expected levels of Damage.

Lessons learned: The CDCM-TAOS system provides reliable base of information for the design review of sea defenses.